INTERACTIVE CONTROL DEVICE AND METHOD FOR OPERATING THE INTERACTIVE CONTROL DEVICE

FIELD OF THE INVENTION

[0001] The present invention relates to a method for operating an interactive control device having a display device and a control device having a display device.

BACKGROUND INFORMATION

[0002] Automotive applications in a motor vehicle cockpit are often controlled via so-called interactive control devices. An interactive control device includes a display device on which one or more control elements are graphically represented. The individual automotive applications are assigned to the control elements. An action, called a control action in the following, is activated or triggered in that the user moves a body part, for example a finger of a hand, toward the graphical representation of the control element. It depends on the design of a sensor unit of the control device whether, in order to activate the control action associated with the control element, the body part must touch a sensor unit (e.g. a touch-sensitive film) situated in front of the display device or integrated into it, or whether it suffices to approach the respective control element to within a certain distance.

[0003] Interactive control devices in which touch is required in order to trigger the control action are called touch screen control devices. Interactive control devices that may be activated without touch include for example sensors that are able to detect high-frequency signals that are transmitted via the human body. For this purpose it is necessary for a high-frequency transmitter to be situated near the body or in contact with the body. In a motor vehicle, such a high-frequency transmitter may be integrated into the vehicle seat, for example. Methods and devices for transmitting information using high-frequency signals via a human body are described for example in PCT International Published Patent Application No. WO 2004/078536.

[0004] The region in which the body part must be located in order to activate the control action is called the activation region. In a touch screen control device, the activation region is a two-dimensional area on the surface of the touch screen control device. The activation area normally coincides with the display area of the control element to be operated. In a control device that is controllable in a contactless manner, the activation region is normally a three-dimensional region in close proximity above or adjacent to the surface of the display device. A projection of the activation region along a surface normal of the surface of the display device onto the display device is normally congruent with the display area of the associated control element.

[0005] The representation of information on the display devices of such interactive control devices is directed in certain conventional arrangements not at the resolution capacity of the human eye, but primarily at an accuracy of aim and a motoric precision of the human fingers of users.

[0006] Control elements represented on a display device, which are also called virtual control elements, include menus, buttons, etc. They may also assume the shape of graphical objects, however, in interactively designed navigation maps, for example. Generally, such virtual control elements are also called widgets. Nowadays, the control elements on interactive control devices are generally quite large so that a user is able to activate them comfortably and easily using his fingers. As a consequence, the display regions of the control elements often cover a considerable part of the display area of the display device, which could otherwise be used for additional information. Frequently, the display regions cover graphical information "behind" them. If the representation of the control elements on the display device is rendered smaller, then one obtains space for representing information, but an ease of operation is reduced since it is considerably more difficult to "hit" the control elements using one's finger.

[0007] It is conventional to scale the scaling of the control elements in response to a first control action. In such control devices, at least two control operations are required in order to activate and perform a desired control action.

[0008] U.S. Pat. No. 5,579,037 describes a display device having an electromagnetic digitizing tablet, by which Japanese characters, which are represented on the display device, may be entered. The digitizing tablet includes a stylus connected to the digitizing tablet by a wire. If the stylus is brought to a first distance with respect to the display device, then a displayed region around the position, over which the stylus is located, is displayed in a magnified manner. As long as the distance of the stylus from the display device is smaller than the first distance and greater than a second distance, which is smaller than the first distance, the magnified region is adapted to a change in position of the stylus in parallel to the display device. If the second distance is undershot, then the magnified region is no longer adapted as a function of the movement parallel to the display surface such that it is possible to enter one of several magnified characters by touching the display device at the location at which the corresponding magnified character is displayed. Such a control device, which can only be operated by a stylus, is not suited for many applications such as an interactive control device in a motor vehicle cockpit, for example. Furthermore, in a moving vehicle, it is difficult to move a stylus at a predefined distance parallel in front of the display device in order to have the correct detail magnified.

[0009] German Published Patent Application No. 10 2004 045 885 describes a control element, which preferably takes the form of a turn-push-pull knob, for a motor vehicle for controlling a function of the motor vehicle, in particular by pushing on the control element, touching the control element, turning the control element and/or pulling the control element, the control element having assigned to it a lighting device for illuminating the control element, an approach sensor for detecting an approach of an operator of the control element and a lighting controller for adjusting the illumination of the control element as a function of an output signal of the approach sensor.

[0010] Therefore, an interactive control device is desirable, which on the one hand respectively allows for an optimal representation of information, while at the same time offering a great ease of operation in that control elements are readily activated.

SUMMARY

[0011] Example embodiments of the present invention provide a control device and a method for operating an interactive control device, which allow both for an optimal communication of information adapted to the human eye and at the same time a comfortable activation of control elements.

[0012] Example embodiments of the present invention provide that the information represented on the display device is